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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,573	10/23/2003	Svend Frolund	200315385-1	2171

22879 7590 06/13/2006

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EXAMINER

ROJAS, MIDYS

ART UNIT	PAPER NUMBER
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2185

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,573

Applicant(s)

FROLUND ET AL.

Examiner

Midys Rojas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-27 and 35-50 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-27 and 35-50 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/23/03, 7/21/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Claims 1-8, and 28-34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/4/06.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 10/23/03 and 7/21/05 have been considered by the examiner.

Drawings

3. The drawings received on 10/23/03 have been accepted by the examiner.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 9, 25, and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by the limitation “the first and second quorums each meeting a quorum condition of a number such that any two selections of the number of the stripe blocks intersect in a minimum number of the stripe block needed to decode the stripe”. Clarification is necessary.

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6. Claims 24 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the method of writing data comprises receiving a data block for **storage within a stripe of erasure coded data** (as claimed in claim 9) when the erasure coded data was not previously stored using a striping technique (as claimed in claim 24). Clarification is necessary.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 9-23, 25-27, and 35-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsunami et al. (5,740,465).

Regarding Claim 9, Matsunami discloses a method of writing data comprising the steps of receiving a data block for storage within a stripe of erasure coded data (receiving a host command from the host computer), the stripe comprising stripe blocks (data is divided into a plurality of data units called stripes, Col. 1, lines 43-44); sending a query message to each of a plurality of storage devices upon which the stripe of erasure coded data is stored (queuing the command in a command queuing means which stores and manages the commands); receiving a query reply message from each of at least a first quorum of the storage devices (command start message); sending a modify message to each of the storage devices (interpreting the host

command and generating a disk command); and receiving a write reply message from each of at least a second quorum of the storage devices (command end message, see Col. 10, lines 45-67). In this system the stripes are stripes of erasure-coded data since the data is subject to parity code protection, which is a form of erasure coding.

Regarding Claim 10, Matsunami discloses the stripe blocks comprising a first number of data blocks and a second number of parity blocks (data is divided into a plurality of data units called stripes, and a group called a parity group is formed of all the stripes... Col. 1, lines 43-46).

Regarding Claim 11, Matsunami discloses the method wherein the query message sent to the storage device (queuing the command in a command queuing means which stores and manages the commands, Col. 10, lines 45-67) upon which the data block is to be stored includes an indicator which is represented by the command's indication of what type of command it is (write or read command).

Regarding Claim 12, Matsunami discloses the method wherein the query messages include a timestamp indicating a current time. Since the system includes a data transfer controller for giving an instruction appropriate transfer timing to the data controller (Col. 10, lines 45-67), a timestamp must be provided with the command in order to properly perform this operation.

Regarding Claims 13 and 14, Matsunami discloses the method wherein the reply messages of the first quorum each indicate that the timestamp is later than a pending write timestamp and later than a validation timestamp of a previous version of the data block. Since the reply message indicates a command start message, the timing of the data transfer controller must indicate that the current time is later than a pending write timestamp (which means that the

write can be performed because the previous write has finished) and later than a validation timestamp (which means that the previous version of the data block is no longer valid and therefore, can be modified). See Col. 10, lines 45-67.

Regarding Claims 15, Matsunami discloses the method wherein the query reply message from the storage device upon which the data block is to be stored includes the validation timestamp and the previous version of the data block since these are stored in the block of data the will be written to by the command and the command start message points the system to such a location.

Regarding Claim 16, Matsunami discloses the method wherein each of the modify messages include the timestamp and the validation timestamp. Since the system includes a data transfer controller for giving an instruction appropriate transfer timing to the data controller (Col. 10, lines 45-67), timestamps must be provided with the command in order to properly perform this operation.

Regarding Claim 17, Matsunami discloses the method wherein the modify messages sent to the storage device upon which the data block is to be stored includes the new data block, since the new data block is what is to be stored in its place (modification).

Regarding Claims 18 and 22, Matsunami discloses the method wherein the modify messages sent to the storage device in the form of generated disk commands include the previous version of the data block, since the command points to the location in which this data block is presently stored, and the new data block, since the new data block is what is to be stored in its place (modification).

Regarding Claim 19, Matsunami discloses the method wherein the write reply messages from the second quorum indicate the validation timestamp equals a maximum timestamp for the stripe block stored on the storage device. In receiving a command end message, the system is essentially stating that the timestamp equals the maximum timestamp and therefore, the command has ended.

Regarding Claim 20, Matsunami discloses the method wherein the write reply message from the second quorum indicates that the timestamp is no earlier than the pending write timestamp. In receiving a command end message, the system may be indicating that the previous pending write is still being executed and therefore, the command must wait.

Regarding Claim 21, Matsunami discloses the method wherein the write reply message from the storage device, which stored the data block, indicates that the data block was stored successfully. In the case where no errors are reported, the command end message indicated a successful command completion.

Regarding Claim 23, Matsunami discloses the method wherein the stripe or erasure coded data was previously stored using a technique of striping (as described in Col. 1, lines 38-51).

Claim 25 is rejected using the same rationale as that of Claim 9 wherein the stripe blocks comprise a first number of data blocks and a second number of parity blocks (data is divided into a plurality of data units called stripes, and a group called a parity group is formed of all the stripes..., Col. 1, lines 43-46); the query messages sent to a target storage device include a timestamp indicating a current time. Since the system includes a data transfer controller for giving an instruction appropriate transfer timing to the data controller (Col. 10, lines 45-67), a timestamp must be provided with the command in order to properly perform this operation; and

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wherein the reply messages of the first quorum each indicate that the timestamp is later than a pending write timestamp and later than a validation timestamp of a previous version of the data block. Since the reply message indicates a command start message, the timing of the data transfer controller must indicate that the current time is later than a pending write timestamp (which means that the write can be performed because the previous write has finished) and later than a validation timestamp (which means that the previous version of the data block is no longer valid and therefore, can be modified). See Col. 10, lines 45-67. The query reply message in the form of a command start message includes the validation timestamp and the previous version of the particular data block since these are stored in the block of data the will be written to by the command and the command start message points the system to such a location. In receiving a command end message, the system is essentially stating that the timestamp equals the maximum timestamp and therefore, the command has ended.

Claims 26-27 are rejected using the same rationale as that of claim 18.

Claim 35 is rejected using the same rationale as that of Claim 9.

Claim 36 is rejected using the same rationale as that of Claim 10.

Claim 37 is rejected using the same rationale as that of Claim 11.

Claim 38 is rejected using the same rationale as that of Claim 12.

Claim 39 is rejected using the same rationale as that of Claim 13.

Claim 40 is rejected using the same rationale as that of Claim 14.

Claim 41 is rejected using the same rationale as that of Claim 15.

Claim 42 is rejected using the same rationale as that of Claim 16.

Claim 43 is rejected using the same rationale as that of Claim 17.

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Claim 44 is rejected using the same rationale as that of Claim 18.

Claim 45 is rejected using the same rationale as that of Claim 19.

Claim 46 is rejected using the same rationale as that of Claim 20.

Claim 47 is rejected using the same rationale as that of Claim 21.

Claim 48 is rejected using the same rationale as that of Claim 22.

Claim 49 is rejected using the same rationale as that of Claim 23.

The claims were rejected as best understood by the examiner due to 112 issues present within the independent claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Midys Rojas whose telephone number is (571) 272-4207. The examiner can normally be reached on M-F 5:30am - 4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Midys Rojas
Examiner
Art Unit 2185

MR
June 11, 2006


PIERRE VITAL
PRIMARY EXAMINER